EXHIBIT 2

REDACTED VERSION OF DOCUMENT SOUGHT TO BE SEALED

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

HUAWEI TECHNOLOGIES CO., LTD., HUAWEI DEVICE USA, INC., and HUAWEI TECHNOLOGIES USA, INC.,
 	
       Plaintiffs / Counterclaim-Defendants,
 	
v.
 	
SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC.,
 	
       Defendants / Counterclaim-Plaintiffs,
 	
and
 	
SAMSUNG RESEARCH AMERICA,
 	
       Defendant,
 	
v.
 	
HISILICON TECHNOLOGIES CO., LTD.,
 	
       Counterclaim-Defendant.
	Case No. 3:16-cv-2787-WHO

EXPERT REPORT OF DAVID LYON, PH.D.
REGARDING NONINFRINGEMENT OF U.S. PATENT NO. 8,724,613

smartphones, and other communication devices. Any such tutorial may also address any technical issues that Huawei's experts raise in their reports.

27.   I have provided an overview of the technology in my Opening Report. Opening Report at ¶¶ 39-19. I incorporate that discussion by reference. At paragraph 72 of his report, Dr. Akl implies that scheduling, sending, and multiplexing "eMBMS and other services (unicast, multicast, broadcast) was a novel feature of the '613 patent." Akl Opening Report at ¶71. The '613 patent, however, describes the use of "mixed carrier" mode to multiplex MBMS and other services in the same carrier in the background section as a known technology at the time of the '613 invention. '613 patent at 1:54-57.

28.   Dr. Akl refers to the introduction of MBSFN areas in LTE MBMS technology. Akl Opening Report at ¶ 70. Dr. Akl further opines that "all base stations in an MBSFN area transmit the same eMBMS content in **reserved** subframes . . . ." *Id.* (emphasis added). While Dr. Akl correctly acknowledges that the base station first sends information to the mobile device to reserve MBSFN subframes, this reservation is not limited to use for MBMS. As I explain below, the LTE standard in TS 36.331 first requires the base station to send information in an information block called SystemInformationBlockType2 ("SIB2"), which sends information "reserving" MBSFN subframes for various purposes, but not limited to transmitting MBMS. TS 36.331 v.10.0.0 §§ 5.2.2.9, 6.3.1 and TS 36.213 v10.2.0 § 7.1. This initial reservation does not dictate which subframes will in fact contain MBMS information—it is just a reservation of MBSFN capable subframes for later use by the network for various purposes. In order to transmit and receive MBMS service information in the LTE system, the base station sends additional information in another system information block type (SIB13) and also in one or more RRC messages sent over the Multicast Control Channel (MCCH), each called

MBSFNAreaConfiguration, which are separate and distinct from the MBSFN reservation in

SIB2. TS 36.331 v.10.0.0 §§ 5.8.1.1, 5.8.2.3, 6.2.2, 6.3.1. This second set of information

contains information regarding which MBSFN subframes will in fact contain MBMS service

information.

VII.   THE '613 PATENT

29.   The '613 patent is titled "Method and Device for Service Time Division

Multiplexing." The '613 patent was filed on February 24, 2012 and claims foreign priority to

Chinese Application CN 2007 1 0084514, which was filed on February 12, 2007. The '613

patent issued on May 13, 2014. It is subject to a terminal disclaimer to U.S. Patent No.

8,149,814. The inventors of the '613 patent are Junwei Wang, Xiaoan Fan, and Jianghua Liu.

30.   I incorporate by reference the overview discussion of the '613 patent set forth in

my Opening Report. Opening Report at ¶¶ 65-76.

A.   Huawei's Asserted Claims

31.   I have been informed and understand that Huawei has alleged in this litigation

that Samsung has infringed claims 1 and 5 of the '613 patent. The text of both claims is given

below:

32.   Claim 1 provides:

1. A method for communicating, comprising:

receiving, by a user equipment (UE), a service sent by a base station, the service being sent in one or more subframes that are designated as specific subframes, the specific subframes being selected from one or more radio frames that are designated as specific radio frames, the specific radio frames being selected from a time unit, wherein the time unit comprises 2^M radio frames, each of the radio frames containing a number R of subframes that can be allocated to carry the service, where R is a natural number, and M is a nonnegative integer; and

Management and the services provided by the physical layer to the upper layers."

http://www.3gpp.org/specifications-groups/ran-plenary/ran2-radio-layer-2-and-radio-layer-3-rr.

41.   Based on my review of the documents, Huawei and a number of other companies made a series of proposals for MBSFN subframe allocation signaling for LTE from March 2007 to July 2008. These proposals were initially made to RAN1 working groups, but through a liaison statement to RAN2, the proposals were sent to RAN2 working groups for evaluation.

42.   In March 2007, Huawei submitted to the RAN Working Group 1 Meeting #48bis its proposal R1-071690, entitled "MBSFN Subframe Indication." In this proposal, Huawei made three conclusions:

4   Conclusion

In the contribution, we have proposed an efficient method for subframe type indication, having the following 3 basic features:

-   The period over which the subframe type information changes is composed by 2^M radio frames, M equal to 10 as an example.

-   The MBSFN frames are periodically distributed and the associated signalling is broadcast via CCPCH or via PDSCH used for BCH.

-   The MBSFN subframes are evenly distributed within a MBSFN frame, and the distribution of MBSFN subframes in each MBSFN frame is the same. Node B broadcasts the number of MBSFN subframes in one frame via CCPCH or via PDSCH used for BCH.

R1-071690 at Section 4. This proposal closely resembles the alleged invention set forth in the '613 patent. A Huawei spreadsheet that summarizes all the contributions Huawei made to the RAN Working Group 1 from Meeting #40bis to #51bis states that the RAN Working Group 1 did not treat R1-071690. HW_Samsung_00320007.

43.   In June 2007, Huawei joined Nokia Siemens Networks' and Nokia's contribution R1-072963, which was submitted to the RAN Working Group 1 Meeting #49bis, entitled "Signaling of MBSFN subframe allocation on D-BCH." In this contribution, Nokia and Huawei state that the MCCH is not a suitable channel for delivering the MBSFN subframe allocation

relates to MBMS in LTE. As I detail below, TS 36.331 v8.4.0 was one of the earliest releases that disclosed the use of MBSFN in LTE. In Release 8, 3GPP had not finalized or even set forth any specifications for how multicast services would be transmitted and received in the LTE network. In fact, the Release 8 LTE standards do not provide a UE manufacturer necessary information required to implement MBMS services.

59.   As further evidence that TS 36.331 v8.4.0 did not set forth how multicast services would be supported in the standard, TS 36.331 v8.4.0 only contains a single use of the term MBMS, which is located in the glossary of abbreviations. A simple text search reveals that the term MBMS is not used anywhere else in TS 36.331 v8.4.0. By contrast, TS 36.331 v9.2.0 and later versions have dedicated sections titled "MBMS" and "MBMS information elements" which describe how scheduling of MBMS services are accomplished and how MBMS data associated with such services are transmitted and received in the LTE network. TS 36.331 v9.2.0, Sections 5.8. and 6.3.7.[1] Neither Huawei in its infringement contentions nor Dr. Akl in his opening expert report identify these MBMS sections in TS 36.331 v9.2.0 and later versions. Instead, they rely on their incorrect understanding of MBMS in TS 36.331 and point to the incomplete standards on MBSFN frames and subframes set forth in TS 36.331 v8.4.0 to allege the Accused Products infringe the '613 patent. Since TS 36.331 v8.4.0 does not set forth how a UE should receive MBMS services or any position information associated with MBSFN frames and subframes that actually contain MBMS service information, a UE operating based on the disclosures in TS 36.331 v8.4.0 and the disclosures that Dr. Akl identifies in his Opening Report cannot infringe the asserted claims.

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[1] MBMS for LTE was specified in Release 9. However, enhancements were made in Release 10. *See* LTE Broadcast Technology is Ready to Deploy and Evolve (HW_Samsung_00848373-387) at 2. For my analysis below, I rely on Release 10 to show the eMBMS standards that were added after Release 8.

transmitted in SIB2. He contends that "subframeAllocation," transmitted in

MBSFN_SubframeConfiguration in SIB2 is an indication of the subframes that are allocated for

MBSFN within "radioFrameAllocation." Akl Opening Report at ¶¶ 85, 103-104; TS 36.331

v8.4.0, Section 6.3.1.

64.   Dr. Akl, however, fails to state that MBSFN_SubframeConfiguration in SIB2

merely sets forth the subframes that are *reserved* for MBSFN in downlink. The MBSFN frames

and subframes can be "reserved" by the base station for other purposes, not as an indication of

the frames and subframes that will all contain MBMS services. For example,

MBSFN_SubframeConfiguration in SIB2 can inform the MBMS-processing portions of the UE

which of the received subframes can be ignored since they cannot be bearing MBMS services.

However, this does not mean that the MBSFN subframes identified in MBSFN-

SubframeConfiguration identify the MBSFN subframes that actually contain MBMS services—

these are merely "reserved" subframes. The identified MBSFN subframes in

MBSFN_SubframeConfiguration in SIB2 may or may not eventually contain MBMS service

information, and therefore, they do not indicate position information of actually transmitted

specific radio frames carrying MBMS services.

65.   Further describing the role of SIB2 is SIB2's mbsfn-SubframeConfigList, which

is set forth in the following sections of TS 36.331 and TS 36.213. First referring to §5.2.2.9 of

TS 36.331, the standard has the following relevant statements:

> In the subframes indicated by the higher layer parameter *mbsfn-SubframeConfigList* except the subframes indicated by higher layers to decode PMCH, when a UE is configured in transmission mode 9, the UE shall upon detection of a PDCCH with CRC scrambled by the C-RNTI with DCI format 1A or 2C intended for the UE, decode the corresponding PDSCH in the same subframe.

> In the subframes indicated by the higher layer parameter *mbsfn-SubframeConfigList* except the subframes indicated by higher layers to decode PMCH, when a UE is configured in transmission mode 9, the UE shall upon detection of a PDCCH with CRC scrambled by the SPS C-RNTI with DCI format 1A or 2C or for a configured PDSCH without PDCCH intended for the UE, decode the corresponding PDSCH in the same subframe.

TS 36.213 v10.2.0, Section 7.1.

67.   In summary, the two 3GPP documents together (36.331 and 36.213) are specifying that the MBSFN-SubframeConfig information carried in SIB2 is transmitted to the UE to let the UE know that most of the time it does not have to look for PDSCH formatted information in those subframes. However, it goes further and dictates some circumstances (namely when the UE is in transmission mode 9 AND the subframes are not designated as PMCH subframes by higher layers) when even the subframes indicated by MBSFN-SubframeConfig in SIB2 can be used for PDSCH transmissions. None of these SIB2 related specifications speak to the establishment and control of MBMS services conveyed over any of these MBSFN eligible subframes, as compared to TS 36.331 v. 10.0.0 Section 5.8 and the clear teaching of the role of SIB13 and the MBSFNAreaConfiguration message and the IEs and fields contained therein. The use of the MBSFN_SubframeConfiguration information in SIB2 is to alert the UE to which subframes are eligible to convey MBMS services, and under what narrow conditions those same subframes may carry PDSCH—not an indication of position information of the subframes that actually contain transmitted MBMS services.

68.   ██

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nor Dr. Akl could map this claim limitation to 3GPP TS 36.331 v8.4.0, because his version of the standard did not contain any information on transmitting or receiving MBMS services in LTE. TS 36.331 v8.4.0 was one of the first versions to include MBSFN in the LTE standard, but it did not set forth specifications describing how a UE could actually receive MBMS services. It was not until later versions, beginning with Release 9, that the LTE Standard began to set forth the necessary specifications to enable transmitting and receiving MBMS services over the LTE network.

2.   3GPP LTE Release 9 Standards and Later

70.   3GPP began identifying the details of transmitting and receiving MBMS service information to fully enable the commercial launch of MBMS services over LTE networks in Release 9 of the LTE standards and set forth additional enhancements in Release 10 of the LTE standards. Prior to Release 9, a UE manufacturer could not have built a fully operational UE that could receive and process MBMS services in LTE, because that portion of the standard had not yet been completed and incorporated in the standard, and was therefore, not available for incorporation into product embodiments.

71.   While these later standards still set forth specifications for a UE to receive SIB2, the MBSFN-SubframeConfig information element transmitted in SIB2 contains a single set of position information to indicate *reservation* of frames and subframes that *might* carry MBMS data. The information in SIB2 in the Release 8, 9, and later versions of the LTE standard do not convey the parameters necessary for the UE to support MBMS services. Even in Release 9 and later, where the MBMS system specifications are more complete, the MBSFN-SubframeConfig information element transmitted in SIB2 is still used only to indicate to the UE reservation of

potential MBSFN subframes, and it does not identify the frames and subframes that are allocated

to carry one or more MBMS services, as Dr. Akl contends.

72.   Section 5.8 in TS 36.331, titled "MBMS," was first added to the LTE standard in

Release 9. Prior to Release 9, TS 36.331 did not include this section. *See, e.g.*, Section 5.8 in TS

36.331 v 9.2.0 and later versions set forth the scheduling, transmission, and reception of MBMS

in the LTE network.

73.   TS 36.331 v 9.2.0 described a new system information element—

"SystemInformationBlockType13" ("SIB13"). TS 36.331 v9.2.0 Section 6.3.1. SIB13 was not

included in previous releases of the standard and was not included in TS 36.331 v.8.4.0, which

Huawei and Dr. Akl use to support their claims of infringement. SIB13 "contains the

information required to acquire the MBMS control information associated with one or more

MBSFN areas." TS 36.331 v10.0.0 Section 6.3.1; *see also id*. at Section 5.8.1. SIB13 informs

the UE of certain control information related to MBSFN, including scheduling information for

MBMS.

–   *SystemInformationBlockType13*

The IE *SystemInformationBlockType13* contains the information required to acquire the MBMS control information associated with one or more MBSFN areas.

```
                 SystemInformationBlockType13 information element

-- ASN1START

SystemInformationBlockType13-r9 ::= SEQUENCE {
    mbsfn-AreaInfoList-r9              MBSFN-AreaInfoList-r9,

    notificationConfig-r9             MBMS-NotificationConfig-r9,
    lateNonCriticalExtension          OCTET STRING                    OPTIONAL,    -- Need OP
    ...
}

-- ASN1STOP
```

TS 36.331 v10.0.0, Section 6.3.1 (emphasis added).

– *MBSFNAreaConfiguration*

The *MBSFNAreaConfiguration* message contains the MBMS control information applicable for an MBSFN area. E-UTRAN configures an MCCH for each MBSFN area i.e. the MCCH identifies the MBSFN area.

    Signalling radio bearer: N/A

    RLC-SAP: UM

    Logical channel: MCCH

    Direction: E-UTRAN to UE

MBSFNAreaConfiguration message

```
-- ASN1START

MBSFNAreaConfiguration-r9 ::=      SEQUENCE {
    commonSF-Alloc-r9                  CommonSF-AllocPatternList-r9,
    commonSF-AllocPeriod-r9            ENUMERATED {
                                           rf4, rf8, rf16, rf32, rf64, rf128, rf256},
    pmch-InfoList-r9                   PMCH-InfoList-r9,
    nonCriticalExtension               MBSFNAreaConfiguration-v930-IEs        OPTIONAL
}

MBSFNAreaConfiguration-v930-IEs ::= SEQUENCE {
    lateNonCriticalExtension           OCTET STRING                          OPTIONAL,  -- Need OP
    nonCriticalExtension               SEQUENCE {}                           OPTIONAL   -- Need OP
}

CommonSF-AllocPatternList-r9 ::=    SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-
SubframeConfig

-- ASN1STOP
```

TS 36.331 v10.0.0 Section 6.2.2.

81.   The MBSFN-SubframeConfig transmitted in MBSFNAreaConfiguration on the

MCCH is different from the MBSFN-SubframeConfig information transmitted on SIB2 as set

forth in Dr. Akl's Opening Report. The difference is that when MBSFN-SubframeConfig is

transmitted in SIB2, it only identifies the "reserved" MBSFN information; it does not set forth

the subframes that actually contain data for MBMS services. As mentioned above, the MBSFN-

SubframeConfig information in SIB2 identifies "reserved" subframes that are reserved by the

base station for various purposes, not for identifying subframes that contain specific MBMS

service data. In contrast, the MBSFN-SubframeConfig and the PMCH-InfoList information that

are transmitted in the MBSFNAreaConfiguration message on the MCCH set forth the scheduling

information needed to support transmitted MBMS service data. TS 36.331 v 8.4.0, Section

6.3.1; ███

█████████████████████████████████████ Dr. Akl only identifies the

MBSFN-SubframeConfig information transmitted on SIB2, which as shown above, does not

contain position information for the frames and subframes that actually contain MBMS.

82.   As explained above, Dr. Akl's Opening Report fails to take into account this

significant change in the standard starting in Release 9 that relates directly to scheduling MBMS

in an LTE network. By relying solely on the incomplete Release 8 version of TS 36.331, Dr. Akl

did not appreciate this change that took place in the standard. Instead, by relying on Release 8,

he incorrectly points to position information that is not the position information of the claims—

position information for the specific frames and subframes that contain the service.

C.   Accused Technology is Optional in the LTE Standard

83.   As explained above, Dr. Akl alleges that the Accused Products that practice

36.331 v.8.4.0 and later, Section 6.3.1, infringe the Asserted Claims of the '613 patent. The

sections that Dr. Akl identifies as infringing the Asserted Claims are OPTIONAL features of the

3GPP Standard.

84.   The 3GPP standards identify certain features of the standards as OPTIONAL and

certain features of the standard as MANDATORY. When a feature is OPTIONAL, that field can

be omitted (*i.e.*, not performed) and the UE will still comply with the respective 3GPP standards.

```
Alternatively, a field with optional presence may be declared with the keyword OPTIONAL.  It identifies a field for
which a value can be omitted. The omission carries semantics, which is different from any normal value of the field:

-- /example/ ASN1START

PRACH-Configuration ::=            SEQUENCE {
    rootSequenceIndex                  INTEGER (0..1023),
    prach-ConfigInfo                   PRACH-ConfigInfo                    OPTIONAL    -- Need ON
}

-- ASN1STOP
```

TS 36.331 at Section A.3.5 (emphasis added).

118.

C.   **The Accused Products Do Not Infringe "the service being sent in one or more subframes that are designated as specific subframes, the specific subframes being selected from one or more radio frames that are designated as specific radio frames" (Claims 1 and 5)**

119.   Dr. Akl's infringement allegations for this limitation are based entirely on the

MBSFN-SubframeConfiguration information element transmitted in the SIB2 as set forth in TS

36.331 v8.4.0, Section 6.3.1. Dr. Akl contends that a UE can use "radioFrameAllocation"

element in MBSFN-SubframeConfiguration "to identify which radio frames have been

designated as specific radio frames that contain MBSFN subframes." Akl Opening Report at ¶

83. Dr. Akl also contends that "[t]he number of subframes designated as specific MBSFN

subframes is defined by the "subframeAllocation" element in MBSFN-SubframeConfiguration.

Akl Opening Report at ¶85.

120.   As explained in detail above, the MBSFN-SubframeConfiguration transmitted in

SIB2 does not contain an indication of the frames and subframes that actually contain the MBMS

service. The base station transmits "radioFrameAllocation" and "subframeAllocation" elements

in MBSFN-SubframeConfiguration in SIB2 as "reserved" frames and subframes that are used for

other purposes, not as an indication of the frames and subframes that actually contain the MBMS

service. TS 36.331 v 8.4.0, Section 6.3.1;

.

Accordingly, any service being sent by a base station to a UE is not being sent in specific frames

and subframes as set forth in the "radioFrameAllocation" and "subframeAllocation" elements in

MBSFN-SubframeConfiguration in SIB2.

121.   As explained in detail above, scheduling information related to MBMS services actually transmitted over the network, as opposed to the scheduling of reserved frames and subframes for other purposes, are sent in the MBSFNAreaConfiguration message transmitted on the MCCH. TS 36.331 v 8.4.0, Section 6.3.1; █████████████████████████████████

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███████. Although the format of the subject field within SIB2 referenced by Dr. Akl and that of the field within the MBSFNAreaConfiguration element (both called MBSFN-SubframeConfig) are similarly described, they are not put to the same use by the Accused Products, which conform to versions of the 3GPP Release 9 or later. Dr. Akl has not set forth any infringement allegations with respect to the information transmitted in the MBSFNAreaConfiguration message.

122.   As mentioned above, the information in MBSFN-SubframeConfig in SIB2 is used by "legacy UEs," meaning those compliant to 3GPP standard Release 8 or earlier. For Accused Products that are compliant with Release 9 or later and enabled for MBMS, scheduling information related to MBMS is set forth in SIB13 and the MBSFNAreaConfiguration information elements conveyed over PMCH. █████████████████████████████

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███████. Since the MBSFN-SubframeConfig information element in SIB2 does not actually set forth scheduling information related to specific MBMS services sent in MBSFN subframes, the Accused Products do not use any MBSFN-SubframeConfig information elements transmitted in the SIB2 to determine the claimed position information of the specific radio frames and the specific subframes.

period is unrelated to MBMS. Accordingly, RadioResourceConfigCommon is unrelated to the

transmission and scheduling of the claimed service (*i.e.*, MBMS).

135.   As I explained above, Release 9 and later sets forth a more complete version of

the standard for setting forth the requirements for MBMS. In Release 9 and later releases, the

full scope of the scheduling mechanisms for MBMS was published. These standards set forth

messages which carry parameters, such as time periods, that are directly related to the scheduling

of MBMS services, such as MCH Scheduling Period (MSP), which is defined as "the periodicity

used for providing MCH scheduling information (MSI)." Dr. Akl did not analyze and set forth

his opinions of infringement with respect to these later releases of the standards' specifications

that give a description of the required parameters related to MBMS. The Accused Products all

receive scheduling for MBMS services on the MCH.

136.   Specifically, Huawei points to a Release 8 version of the standard to prove

infringement – TS 36.331 v8.4.0. It was not until TS 36.331 v9.2.0 that the standard started to

set forth comprehensive requirements for MBMS, which was later enhanced in TS 36.331

v10.0.0. Huawei points to the MBSFN-SubframeConfig information in SIB2 as containing the

claimed specific subframes and specific frames. However, this information is useless without

other information, such as the MCH Scheduling Period ("MSP"), which is only received from

the base station in an MBSFNAreaConfiguration message which is conveyed over the Multicast

Control Channel (MCCH) which in turn is sent over the Physical Multicast Channel (PMCH).

The MSP is not available in SIB2. Without the MSP, the MBMS data received over the

Multicast Traffic Channel ("MTCH") is never even decoded by the UE. ██████████

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137.   Dr. Akl points to R1-071680 to show that the modification period is the claimed

time unit. R1-071680 is Huawei's contribution to the 3GPP Working Group RAN 1. However,

R1-071680 does not support Dr. Akl's conclusions that the modification in the

RadioResourceConfigCommon is the claimed time unit. Instead, R1-071680 shows that the

modification period is related to the periodicity of sending MBSFN frame distributions. The

modification period as set forth in the RadioResourceConfigCommon information element is

unrelated to the periodicity of sending MBSFN frame distributions.

138.   ████████████████████████████████████

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141.   As explained in detail above, the MBSFN-SubframeConfiguration transmitted in

SIB2 does not contain an indication of the frames and subframes that actually contain the MBMS

service, and therefore the elements within MBSFN-SubframeConfiguration in SIB2 that Dr. Akl

points to as the received position information does not contain position information related to the

specific frames and subframes that contain the claimed service (i.e., MBMS) .

142.   As explained above, the base station transmits "radioFrameAllocation" and

"subframeAllocation" elements in MBSFN-SubframeConfiguration in SIB2 as "reserved"

frames and subframes that are used for other purposes, not as an indication of the frames and

subframes that actually contain the MBMS service. TS 36.331 v 8.4.0, Section 6.3.1; ███████

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████████████████████████████. Accordingly, any service being sent by a base

station to a UE is not being sent in specific frames and subframes as set forth in the

"radioFrameAllocation" and "subframeAllocation" elements in MBSFN-SubframeConfiguration

in SIB2.

143.   Scheduling information related to MBMS services actually transmitted over the

network, as opposed to the scheduling of reserved frames and subframes for other purposes, are

sent to the UE in the MBSFNAreaConfiguration message transmitted on the MCCH. TS 36.331

v 8.4.0, Section 6.3.1; ███

███ Although the

format of the subject field within SIB2 referenced by Dr. Akl and that of the field within the

MBSFNAreaConfiguration element (both called MBSFN-SubframeConfig) are similarly

described, they are not put to the same use by the Accused Products, which conform to versions

of the 3GPP Release 9 or later. Dr. Akl has not set forth any infringement allegations with

respect to the information transmitted in MBSFN-SubframeConfiguration in the

MBSFNAreaConfiguration message.

144.   As mentioned above, the information in MBSFN-SubframeConfig in SIB2 is only

used for "legacy UEs," and instead the information set forth in SIB13 and the

MBSFNAreaConfiguration information elements set forth scheduling information regarding

actually transmitted MBMS services. ██████████████████████████████████████

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Since the MBSFN-SubframeConfig information element in SIB2 is only used for "legacy UEs"

and do not actually set forth scheduling information related to MBMS services sent in MBSFN

subframes, the Accused Products cannot infringe this limitation by complying with TS 36.331

v.8.4.0.

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F.   The Accused Products Do Not Infringe "wherein the transport channel is mapped to a physical shared data channel" (Claims 1 and 5)

152.   Based on his incorrect mapping of the LTE standards to the asserted claim limitations, Dr. Akl opines that the limitation "wherein the transport channel is mapped to a physical shared data channel" is infringed, because "the SIB2 is transmitted from a base station to a UE on the DL-SCH (Downlink Shared Channel)" and that the "DL-SCH transport channel is mapped to the PDSCH physical shared data channel," citing TS 36.331 v8.4.0 Section 5.2.1.1. for support. Akl Opening Report at ¶ 106. As I explained in detail above, SIB2 is not the correct information element; SIB2 does not contain the position information of the specific frames in the time unit and the specific subframes within the specific frames that contain MBMS service data. Since SIB2 does not contain the claimed position information, the transport channel that the SIB2 is transmitted on and the mapping of that transport channel to a physical shared data channel does not show that the Accused Products infringe this limitation.

153.   As explained above, TS 36.331 v10.0.0 sets forth the standards for implementing MBMS services. TS 36.331 v10.0.0 sets forth that scheduling information required to support MBMS services actually transmitted over the network, as opposed to the scheduling of reserved

frames and subframes for other purposes as transmitted on SIB2. As explained above, the

MBMS scheduling information is sent to the UE in the MBSFNAreaConfiguration message

transmitted on the *MCCH*, not the DL-SCH.

5.8.2   MCCH information acquisition
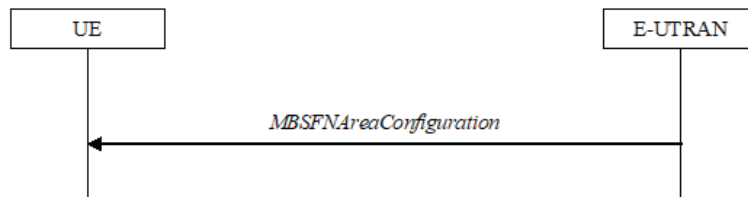
5.8.2.1   General

Figure 5.8.2.1-1: MCCH information acquisition

The UE applies the MCCH information acquisition procedure to acquire the MBMS control information that is broadcasted by the E-UTRAN. The procedure applies to MBMS capable UEs that are in RRC_IDLE or in RRC_CONNECTED.

5.8.2.2   Initiation

A UE interested to receive MBMS services shall apply the MCCH information acquisition procedure upon entering the corresponding MBSFN area (e.g. upon power on, following UE mobility) and upon receiving a notification that the MCCH information has changed. A UE that is receiving an MBMS service shall apply the MCCH information acquisition procedure to acquire the MCCH, that corresponds with the service that is being received, at the start of each modification period.

TS 36.331 v10.0.0 Section 5.8.2 (emphasis added).

154.   The Multicast Control Channel ("MCCH") is a new control channel that was

introduced in Release 9 and included in later releases. As set forth in TS 36.331 v10.0.0, "most

of the MBMS control information is provided on a logical channel specific for MBMS common

control information: the MCCH." 3GPP TS 36.321 is the MAC protocol specification for LTE,

and it defines the channels connecting the upper RRC layer and the middle MAC layer. The

figure below, reproduced from TS 36.321, illustrates the mapping of downlink logical channels

to downlink transport channels in Release 10. As shown below, the new set of logical and

transport channels (that were not included in Release 8) include the MTCH, MCCH, and MCH.

157.   Accordingly, Dr. Akl has not shown that the Accused Products infringe this claim limitation.

G.   The Accused Products Do Not Infringe "the position information of the specific radio frames in the time unit is represented by an interval between two specific radio frames in the time unit . . . wherein the interval is 2^m, and $0 \leq m \leq M$" (Claims 1 and 5)

158.   For the same reasons the Accused Products do not satisfy receiving position information of the specific radio frames in the time unit and receiving position information of the specific subframes within the specific radio frames, the Accused Products do not infringe this limitation. Just as before, Dr. Akl's infringement allegations for this limitation are based entirely on the MBSFN-SubframeConfiguration information element transmitted in the SIB2 from the base station to the UE as set forth in TS 36.331 v8.4.0, Section 6.3.1. Dr. Akl contends that a UE receives MBSFN-SubframeConfiguration information element in the SIB2, and that MBSFN-SubframeConfiguration contains the "radioFrameAllocation" element in MBSFN-SubframeConfiguration . Akl Opening Report at ¶¶ 109-112. According to Dr. Akl, this is the claimed position information of the specific radio frames in the time unit.

159.   As explained in detail above, the MBSFN-SubframeConfiguration transmitted in SIB2 does not contain an indication of the frames and subframes that actually contain the MBMS service, and therefore the "radioFrameAllocation" element within MBSFN-SubframeConfiguration in SIB2 that Dr. Akl points to as the position information of the specific radio frames does contain position information related to the specific frames and subframes that contain the claimed service (*i.e.*, MBMS).

160.   Since Dr. Akl's reliance on "radioFrameAllocation" transmitted in SIB2 does not read on the claimed position information, his analysis of how the position is represented by an interval between two specific radio frames in the time unit wherein the interval is 2^m, and

$0 \leq m \leq M$ is also incorrect, because it relies on position information in the LTE standards that does not infringe the claim limitations. Akl Opening Report at ¶¶ 109-118. The fact that "radioFrameAllocation" may be represented by an interval between two specific radio frames in the time unit wherein the interval is 2^m, and $0 \leq m \leq M$ is irrelevant, because "radioFrameAllocation" is not the claimed position information of the specific radio frames in the time unit.

161.   As explained above, the base station transmits "radioFrameAllocation" in MBSFN-SubframeConfiguration in SIB2 as "reserved" radio frames that are used for other purposes, not as an indication of the radio frames that actually contain the MBMS service. TS 36.331 v 8.4.0, Section 6.3.1; ██

██

Accordingly, any service being sent by a base station to a UE is not being sent in specific radio frames as set forth in the "radioFrameAllocation" element in MBSFN-SubframeConfiguration in SIB2.

162.   ██

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169.

J.   The Accused Products Do Not Infringe When Operating in Systems Using Non-Zero Offset Values (Claims 1 and 5)

171.   The asserted claims require that "the position information of the specific radio frames in the time unit is represented by" one of the formulations listed in the final two claim limitations. These formulations assume a regular spacing of the specific frames within the time unit, where the first specific frame in the time unit begins at the first frame of the time unit. The claims do not provide a mechanism for representing the position of the first specific frame in the time unit to be anywhere other than the first frame of the time unit—a non-zero offset. In other words, the asserted claims do not allow there to be an "offset" of frames in addition to the regular spacing of the specific frames within the time unit. When there is a non-zero offset, the Accused Products do not infringe the asserted claims.

172.   Based on Dr. Akl's infringement allegations, the 3GPP LTE Standards define an offset (*e.g.,* through the use of the defined parameter "radioFrameAllocationOffset" in "MBSFN-

SubframeConfiguration.") Under Dr. Akl's infringement allegation, knowledge of this offset

value is required for accurate representation of the alleged position information of the specific

radio frames.

173.   Below I detail an example where a non-zero offset would not infringe the asserted

claims under Dr. Akl's infringement analysis.
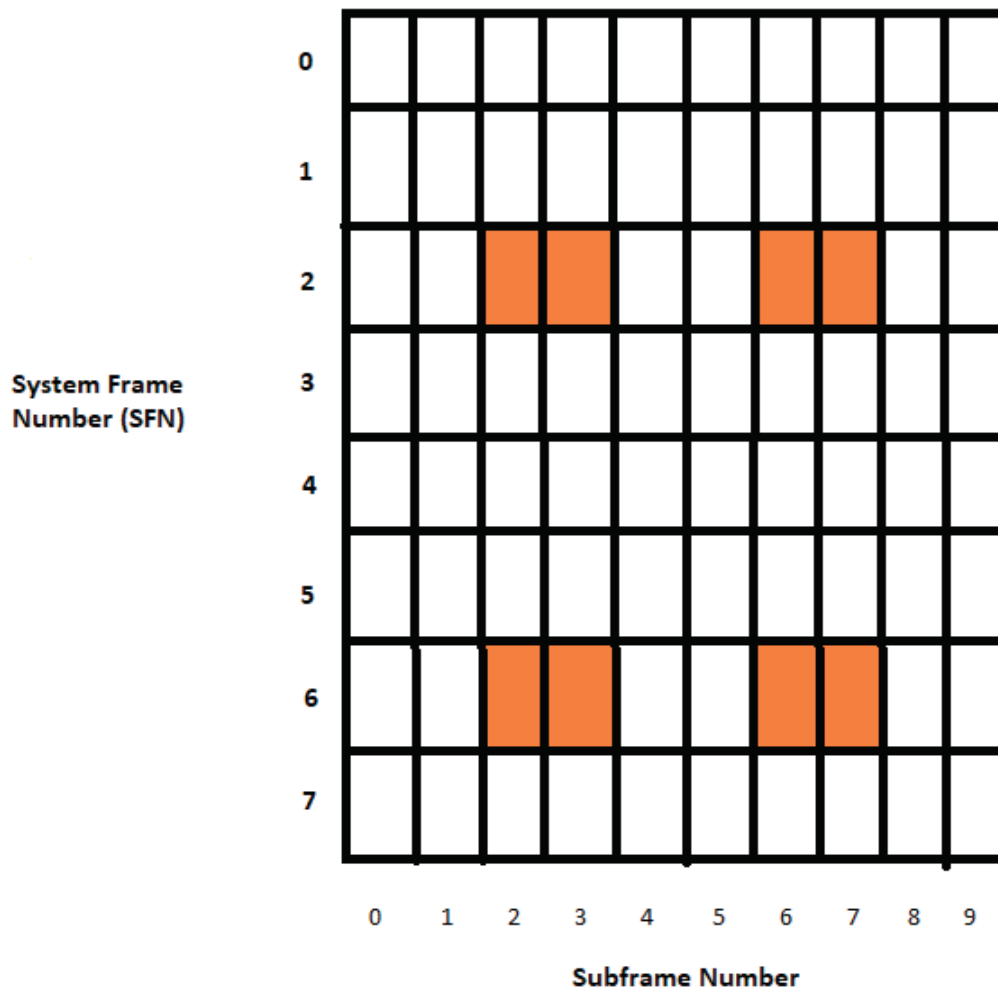
174.   In the example above, the carrier has configured the MBMS specific subframes

using the oneFrame option, and subframe numbers 2, 3, 6, and 7 have been selected in each

specific MBMS system frame.   *See* TS 36.331 v8.4.0 at 102-104. The

radioframeAllocationPeriod has been selected to be n4, which is m=2 under Dr. Akl's

infringement analysis. The radioframeAllocationOffset has been selected to be 2. Thus the

specific radio frames carrying the service appear in frames with SFN 2, 6, 10, etc.

175.   With just the information set forth in the asserted claims, the claims would not

read on this scenario under Dr. Akl's infringement allegations. Without an indication of the

offset value, the asserted claims would not identify the frames carrying the MBMS service in this

example. Under Dr. Akl's infringement allegations, his infringement allegations only apply

when the offset is zero, meaning it starts with the first frame. Therefore, even under Dr. Akl's

incorrect infringement theory, when the offset is non-zero, there is no infringement.

K.   The Accused Products Do Not Infringe When Operating in Certain FourFrame Subframe Allocations

176.   The MBSFN-SubframeConfiguration can be configured for oneFrame allocation

or fourFrames allocation. *See* TS 36.331 v8.4.0, Section 6.3.1. Dr. Akl incorrectly contends that

the Accused Products operating in fourFrames allocation mode infringe the '613 patent claims.

Under Dr. Akl's infringement allegations, in many situations, the Accused Products do not

infringe the asserted claims when operating in fourFrames allocation mode.

177.   Under Dr. Akl's infringement allegations, in oneFrame allocation mode, the

subframe allocation of MBMS services is done within a single frame. The subframe allocation

for a single frame is repeated based on the radioframeAllocationPeriod, which, according to

Huawei's infringement contentions, is sent in the SIB2 information element from the base station

to the UE. Under Dr. Akl's infringement allegations, when the subframeAllocation within the

MBSFN-SubframeConfiguration is set for oneFrame allocation mode, the subframeAllocation

method claim 1. Dr. Akl has not set forth any evidence of actual use of the claimed technology

in claim 1.

M. Network Components are Necessary to Infringe Claims 1 and 5

188. The majority of the claimed limitations require performance in the network, not

the UE. I have highlighted all the limitations in claims 1 and 5 that require performance in the

network, not the UE:

> 1. A method for communicating, comprising:
> receiving, by a user equipment (UE), a service sent by a base station, the service being sent in one or more subframes that are designated as specific subframes, the specific subframes being selected from one or more radio frames that are designated as specific radio frames, the specific radio frames being selected from a time unit, wherein the time unit comprises 2^M radio frames, each of the radio frames containing a number R of subframes that can be allocated to carry the service, where R is a natural number, and M is a nonnegative integer; and
> receiving, by the UE, position information of the specific radio frames in the time unit and position information of the specific subframes in the specific radio frame on a transport channel, wherein the transport channel is mapped to a physical shared data channel;
> wherein the position information of the specific radio frames in the time unit is represented by the number of the specific radio frames in the time unit; or the position information of the specific radio frames in the time unit is represented by an interval between two specific radio frames in the time unit,
> wherein the interval is 2^m, and $0 \le m \le M$, or wherein the interval is the total number of the radio frames in the time unit divided by the number of the specific radio frames in the time unit.

5. A user equipment, comprising:

circuitry configured to receive a service sent by a base station, the service being sent in one or more subframes that are designated as specific subframes, the specific subframes being selected from one or more radio frames that are designated as specific radio frames, the specific radio frames being selected from a time unit, wherein the time unit comprises 2^M radio frames, each of the radio frames contains a number R of subframes that can be allocated to carry the service, where R is a natural number, and M is a nonnegative integer; and

circuitry configured to receive position information of the specific radio frames in the time unit and position information of the specific subframes in the specific radio frame on a transport channel, wherein the transport channel is mapped to a physical shared data channel;

wherein the position information of the specific radio frames in the time unit is represented by the number of the specific radio frames in the time unit; or the position information of the specific radio frames in the time unit is represented by an interval between two specific radio frames in the time unit,

wherein the interval is 2^m, $0 \leq m \leq M$, or wherein the interval is the total number of the radio frames in the time unit divided by the number of the specific radio frames in the time unit.

189.   As shown in the highlighted claims above, the only two limitations that the UE is responsible for handling is receiving a service and receiving the position information. The remainder of the claims, setting forth how the service is sent, the format of the position information, and how the position information is sent is all configured at the network. Dr. Akl's infringement allegations focus solely on the Accused Products and he does not set forth any evidence on whether and how AT&T, Verizon, T-Mobile, or Sprint perform the network limitations in asserted claims 1 and 5.

190.   In addition, I understand that in order to allege that the Accused Products infringe all the limitations of claims 1 and 5 of the '613 patent, Dr. Akl needed to show that Samsung controlled the network to perform these limitations to such a degree that their actions could be imputed to Samsung. However, neither Dr. Akl nor Huawei ever set forth this evidence. Dr. Akl

never references any contract between Samsung at network entities where Samsung requires these third party network entities to perform the limitations of the asserted claims. Accordingly, to the extent there is a determination that the asserted claims require multiple actors to infringe the claims, Dr. Akl and Huawei have not set forth evidence to show that Samsung had any control over the third party network entities, and therefore, the Accused Products would not infringe the asserted claims.

XII.   TESTING THE ACCUSED PRODUCTS DOES NOT ESTABLISH INFRINGEMENT

191.   I disagree with Dr. Akl that "any device that is capable of receiving the eMBMS service or any other service that uses the MBSFN frame structure will infringe the '613 Patent, because the LTE standards specify that the eMBMS service or other such service must be received by the device in the same manner as specified by Claims 1 and 5 of the '613 Patent." Akl Opening Report at ¶126; *see also id.* at ¶¶127-136.

192.   First, as detailed above, Dr. Akl has failed to demonstrate that the LTE standards read on the asserted claims of the '613 patent. Dr. Akl cites to a version of the standard to support his infringement allegations that does not read on the asserted claims—this version (TS 36.331 v8.4.0) was an early version of the LTE standard and does not set forth the details for how a UE and a network transmit and receive MBMS. In fact, as detailed above, Dr. Akl fails to identify anything in the LTE standard that shows that the UE is required to receive a service—a limitation in each of the asserted claims. Without a showing that the LTE standard reads on the asserted claims, Dr. Akl has not shown that Accused Products that practice the LTE standard infringe the asserted claims. Accordingly, the evidence Dr. Akl sets forth in support of his contention that the Accused Products must comply with the LTE standard does not evidence that the Accused Products infringe the asserted claims.

May 25, 2018
Date

David Lyon, Ph.D.